

## WHAT IS CLAIMED IS:

1. A method of assembling a turbine exhaust hood, said method comprising:

coupling a support structure to an upper shell casing such that the shell casing is radially inward of the support structure;

coupling an elliptically-shaped butterfly plate to the upper shell casing such that the butterfly plate is substantially concentrically aligned with respect to a steam inlet extending through the upper shell casing; and

coupling the upper shell casing to a lower shell casing such that a turbine is housed within the exhaust hood and wherein the butterfly plate is positioned to channel steam flow towards the condenser during turbine operations.

2. A method in accordance with Claim 1 wherein coupling a support structure to the upper shell casing further comprises coupling a center rib to the upper shell casing such that the rib extends at least partially axially between opposing ends of the upper shell casing, and such that the rib extends at least partially radially inward from the shell casing.

3. A method in accordance with Claim 1 further comprising coupling at least one corner flow plate within the upper shell casing to facilitate redirecting a direction of steam flowing within said exhaust hood.

4. A method in accordance with Claim 1 further comprising coupling at least one atmospheric diaphragm within an atmospheric diaphragm support ring defined on the upper shell casing.

5. A method in accordance with Claim 4 wherein coupling at least one atmospheric diaphragm within an atmospheric diaphragm support ring further comprises contouring a radially inner surface of the atmospheric diaphragm support ring to substantially match a contour of the upper shell casing.

6. A turbine exhaust hood comprising:

a shell casing comprising an inner surface and an outer surface;

an external support structure coupled to said shell casing outer surface, said external support structure provides structural support to said shell casing; and

a butterfly plate coupled to said shell casing inner surface for channeling flow into said exhaust hood, said butterfly plate having a substantially elliptically-shaped cross-sectional profile that facilitates reducing flow separation losses of fluid flow flowing therethrough into said exhaust hood.

7. An exhaust hood in accordance with Claim 1 further comprising at least one corner flow plate configured to facilitate redirecting a direction of fluid flow flowing within said exhaust hood.

8. An exhaust hood in accordance with Claim 7 wherein said at least one corner flow plate has a conical cross-sectional profile.

9. An exhaust hood in accordance with Claim 6 further comprising:

a rib extending at least partially axially across said exhaust hood along an axis of symmetry of said exhaust hood, said rib comprising a first side and an opposite second side;

a first atmospheric diaphragm support ring positioned at a distance from said rib first side; and

a second atmospheric diaphragm support ring positioned at a distance from said rib second side.

10. An exhaust hood in accordance with Claim 9 wherein at least one of said first atmospheric diaphragm support ring and said second atmospheric diaphragm support ring comprises a radial inner surface that is contoured to substantially match a contour of a portion of said shell casing.

11 An exhaust hood in accordance with Claim 6 further comprising:

a first access opening positioned a distance from an axial axis of symmetry extending through said exhaust hood; and

a second access opening positioned on an opposite distance from said axis of symmetry, said first and second access openings extending through said exhaust hood shell casing.

12. An exhaust hood in accordance with Claim 6 wherein said external support structure comprises a plurality of ribs coupled together to form a lattice-shaped assembly.

13. A turbine assembly comprising:

a turbine; and



an exhaust hood comprising a shell casing, a support structure, and a butterfly plate, said turbine housed within said exhaust hood, said shell casing comprising a radially inner surface and a radially outer surface, said support structure extending across said shell casing outer surface for providing structural support to said shell casing, said butterfly plate coupled to said shell casing inner surface for channeling flow into said exhaust hood, said butterfly plate having a cross-sectional profile that facilitates reducing flow separation losses of fluid flowing therethrough towards said turbine.

14. A turbine assembly in accordance with Claim 13 wherein said exhaust hood further comprises at least one flow plate coupled to said shell casing to facilitate changing a flow direction of steam flowing through the exhaust hood such that flow separation losses are facilitated to be reduced.

15. A turbine assembly in accordance with Claim 14 wherein said at least one flow plate has a conical cross-sectional profile.

16. A turbine assembly in accordance with Claim 14 wherein said exhaust hood further comprises:

a rib extending at least partially axially across said exhaust hood along an axis of symmetry of said exhaust hood, said rib comprising a first side and an opposite second side; and

at least one atmospheric support diaphragm positioned a distance from said axis of symmetry, said atmospheric support diaphragm configured to reduce an operating pressure within said exhaust hood.

17. A turbine assembly in accordance with Claim 16 wherein said at least one atmospheric support diaphragm comprises a radial inner surface and a radial outer surface, said radial inner surface contoured to substantially match a contour of said shell casing.

18. A turbine assembly in accordance with Claim 14 wherein said exhaust hood support structure facilitates reducing flow separation losses of steam flowing through said exhaust hood.

19. A turbine assembly in accordance with Claim 14 wherein said exhaust hood further comprises at least one access opening extending through said shell casing, said at least one access opening positioned a distance from an axial axis of symmetry extending through said exhaust hood.

20. A turbine assembly in accordance with Claim 14 wherein said exhaust hood support structure is coupled together in a lattice-shaped arrangement extending across said exhaust hood.